

Deming's Way

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Introduction

The ultimate curse is to be a passenger on a large ship, to know that the ship is going to sink, to know precisely what to do to prevent it, and to realize that no one will listen! This is the curse that has been visited for a quarter of a century on W. Edwards Deming, revered in Japan as the Father of Quality Control, the man who taught the Japanese how to produce goods of high quality at low cost.

Deming has known for at least twenty-five years that as the Japanese developed their skill in manufacturing, no American producer using conventional American approaches would be able to survive the competition. He knew that no amount of American cleverness in innovation would make up for the fact that the Japanese knew how to make goods of superior quality for less money. Deming had taught the Japanese that higher quality meant lower cost, an idea foreign to most American managers. He foresaw what would happen. Japanese entrepreneurs, observing a successful business in America, such as textiles, steel, autos, or consumer electronics to name but a few, could study the products, reverse engineer them, and produce them at lower cost and higher quality. If one nation has access to another's technologies and is better at the arts and sciences of mass production, it follows that the first nation will invade the markets of the second. It is just a matter of time. Thus it is that one by one, elements of our economy have suffered. Deming has known for a quarter century that unless Americans changed their approach to productivity and quality, the economy would be destroyed. Deming has had to endure the ultimate curse. No one would listen.

Americans do not appreciate the reverence with which Deming is regarded by the Japanese. The annual Deming Prize is the most coveted industrial award in Japan. Winning it is a national event, reported on national television, with parades and ceremonies at which children present flowers to Dr. Deming and monuments are erected in his honor. The Deming medal, with his profile on it, is displayed prominently and proudly.

Japanese industrialists telephone him regularly at his home in Washington, D.C. They invite him to Japan as often as he can come. They listen. They apply his methods. And they have succeeded, as the world knows all too well. But in the United States, if managers have heard of him at all (and most have not), they are likely to say, "Oh yes. The quality control expert." Very few Americans understand what Deming's way is all about. The president of the United States appoints a blue ribbon panel to advise on problems of productivity, and Deming's name is not even mentioned!

Too many people believe that Deming merely teaches simple statistical quality control. They miss the point. American managers travel to Japan, marvel at the behavior of the factory workers, and conclude that it is something inherent in the Japanese culture. They come home convinced that it is not their fault. They blame their problems on the American worker, on taxes, on government regulation, on the decay in society, in short, on anything except their own managerial philosophies.

They do not realize that Deming has developed an entirely new concept of how to manage systems of machines and people. He has evolved a fundamentally new idea. It is revolutionary. It works. Deming's way is not taught in any school of management in America. Indeed, many things taught to managers in our schools and seminars about how to manage enterprises are actually contrary to Deming's way.

Deming's way has an interesting history.¹

During World War II the statisticians of America, under the leadership of such men as Deming, Juran, and Shewhart, pioneered in new methods of control in the wartime industry. America's ability to produce large quantities of high-quality armaments using an unskilled labor force was the miracle that won the war. This miracle was due in no small measure to the methods introduced by these men. They were not just methods of statistical analysis. They represented the beginnings of an entirely new way to look at the operation of a factory.

But when the war ended, the mass markets of America were waiting to be filled, and skillful production management was not required. By 1950 many of the lessons of the war were discarded. New managers came to run new factories. They had little need, they believed, for methods to increase quality and productivity. They did not study them. Business schools did not teach them.

The American market was a powerful deterrent to anyone who wanted to concentrate on high quality. Apparently unsaturable markets swallowed goods of inferior quality. Americans accepted appliances of inadequate performance as though they represented the best that could possibly be done. Americans firmly believed that to increase the reliability of their appliances would have required an increase in cost. And until Deming's way showed that this was false, they had no choice but to believe the myth. By and large they still do.

The years 1941-1945 had taught Deming a profound lesson. He realized that a whole new philosophy of management was possible based on his experiences. And he saw that the basic idea could be put to work in any industry, even the service industries and in ways not thought of during World War II. But Americans would not listen. In retrospect we can understand why. With the rest of the world in disarray, with America providing help to the rest of the world through relief programs and the Marshall Plan, exploding hydrogen bombs, winning Nobel Prizes, expanding its economy explosively, believing it faced the limitless frontier, Americans did not believe they needed advice on how to produce quality goods and increase productivity. After all, weren't we Number One? Our problems were not productivity or innovativeness. We had no competition. If anything, our problems were going to be what to do to fill our leisure-time.

The Japanese faced a different story. Their country was conquered, the economy was in ruins. Gone were the dreams of a "Greater East Asia Co-Prosperity Sphere," based on Japanese military conquest. Their island, smaller than California but with a population half the size of the United States and with very few natural resources, faced a momentous challenge. In 1950, with the aid of the MacArthur government, the Japanese Union of Science and Engineering invited Dr. Deming to come to Japan and tell them about quality control. For them this was a monumental bit of good luck.

During his first visits to Japan, Deming examined what they were doing, studied their work force and its habits, and became convinced his methods could be applied there. With his characteristic audacity he issued an invitation to the top forty-five industrialists in Japan to come to a meeting the next Tuesday; forty-five came. At the meeting he told them about his

¹Note: This paper was originally prepared for distribution in 1981, when America was just beginning the quality journey. If I were to rewrite it today, I would include references to the work of Homer Sarasohn, who was in Japan teaching about Quality for two years before Dr. Deming arrived.

methods and promised them that if they would apply them, within five years Japan would be an important factor in international trade.

In later years some of the attendees were to write about that meeting and say that they and their associates did not believe this strange American who was proposing an impossible scheme. The Japanese industrialists had a much more limited objective. They just wanted to bring Japan back to the level it had attained prior to World War II. They did not believe Deming, but having attended the meeting, they felt they would lose face if they did not at least give his idea a try.

Within six weeks some of the industrialists reported productivity gains of as much as 30 percent without purchasing any new equipment. When the industrialists compared notes, they realized that Deming's way really worked. They then devoted their time and energies to implementing it. The Japanese Union of Science and Engineering set up study teams. Deming suddenly found himself with a development laboratory with 90 million subjects in it. The whole of Japan's industry became his proving ground Today Dr. Deming has had over thirty year's experience with this laboratory.

He has had a chance to test his ideas. When he says he knows what to do to increase quality and at the same time cut costs, he knows whereof he speaks. His credibility is incredible!

What Is Deming's Way?

Consider a trucking firm managed by a man educated according to current management methods taught in our schools of business management. He will consider his job to be to run the company as profitably as he can and to expand its business. To do so he may call on the best consultants he can get to help him design the best possible system. He may set up work standards for the drivers and institute computer-based procedures to keep track of the performance of the drivers, trucks, and dispatchers. He will study his markets and their opportunities. And he will keep extensive records of income and expenses, ever on the alert for opportunities to profit.

Of course, he will not be able to do these things alone, and as his organization grows, he will institute methods to see that his desires for efficiency and performance are carried out. Perhaps he will adopt management by objectives and teach it to his subordinates. He may assign as much as 5 percent of his work force to data gathering and performance monitoring, ever searching for possible profit opportunities.

In short, his idea of a good manager is one who sets up a system, directs the work through subordinates, and by making crisp and unambiguous assignments develops a basis to set standards of performance for his employees. He sets goals and production targets for his people. He rates the employees as objectively as he can, sometimes even calling on consultants to help him do so. He identifies poor performers and gives them further education to meet the work standards, or he replaces them He hopes thereby to create the most efficient system possible.

Contrast this with the behavior of a manager who follows Deming's way. This manager sees his job as requiring him to provide a consistency and continuity of purpose for his organization and to seek ever more efficient ways to meet its purpose. For him, making a profit is necessary for survival but is by no means the main purpose of his organization. His view of the purpose of his organization is to provide the best and least-cost transportation system for his customers and continuity of employment for his workers He does not view the concepts of "best" and "least-cost" as contradictory .

He will consider that he and the workers have a natural division of labor. They are responsible for doing the work within the system, and he is responsible for improving the

system. However, he realizes that the potentials for improving the system are never ending so he does not call on consultants to teach him how to redesign the "best" system for he knows that it doesn't exist. Any system can be continuously improved on. He knows that the only people who really know where the potentials for improvement lie are the workers themselves. He knows that the system is subject to great variability. Traffic conditions change, trucks break down, shipping docks are not always ready to discharge or receive goods, mistakes are made in routing or addressing. There are countless ways for the system to go wrong and out of control, decreasing quality and increasing cost. He knows that these ways occur randomly. To make it possible for him and the workers to work together, he knows they must regard the system in the same way and speak a common language. Therefore he learns elementary statistics and teaches it to the workers, engaging an expert consultant in statistics if necessary to help him and the workers when they come to a problem beyond elementary statistics. All of his employees learn to keep their own statistics. Truck drivers keep track of how long they have to wait at docks and study the circumstances at each event. They develop their own control charts and look for trends, for correlations with other events, usually events beyond their control. The drivers meet with each other and sometimes with the dispatcher and compare notes. They keep data on the performance of their trucks and discuss their statistical charts with the purchasing agent and each other. Based on these data the manager, who is responsible for the system, makes the changes, and the workers, based on their statistical information, help him to learn how effective the changes have been. When the manager instructs the purchasing agent to buy on "quality," not just on first cost, the purchasing agent has the information from the drivers with which to do just that, and to demonstrate that he has done so. Everyone in the system is involved in studying it and proposing how to improve it. Everyone spends about 5 percent of their time in this pursuit. No one spends 100 percent of the time, except the company statisticians. The employees will see the setting of work standards as a dumb idea since it inhibits their ability to improve the system. They will not need to "manage by objectives" because they will be engaged in consistently redefining their objectives themselves and recording the performance of the system.

The workers and the manager will be aware of the results reported by Juran--that in most systems 80 to 85 percent of the problems are with the system and 15 to 20 percent are with the worker. This is an important understanding, for it can free the workers to speak out without fear, a quality of the work place that the manager assiduously cultivates.

Under Deming's way, the manager understands that he needs the workers not only to do the work but to help him to improve the system. Thus he will not regard them simply as robots made of flesh and bone, but he will rather consider them as thinking, creative human beings. No one will have to teach him to be nice to people. He will not try to motivate them with empty slogans, such as "Zero Defects!" Because they will be measuring and counting the defects themselves and helping him to remove them, there will be no need for the slogans. He will not ask them to sign pledges to be polite to customers. Nor will he select the "Polite Trucker of the Week." Instead, he and they will have been studying the records of repeat orders and asking what they can do to improve the statistics.

From time to time he asks for volunteers from his work force to take time out to interview customers and vendors, to understand what they want or can supply to provide better service. They report back to him and the rest of the work force on what they have found, statistically analyzed.

In short, the Deming-trained manager will have a natural basis for building a team and will not have introduced adversarial relations.

Under currently taught methods of management it is presumed that the relation between boss and worker is inherently adversarial. The result is that bosses who wish to fit the understood

image must be careful not to develop too intimate a relationship to the worker, lest they lose their objectivity in judging and rewarding performance. (Recall the restrictions on officers in the military against mixing socially with the enlisted men. This is probably a good idea for a system in which no one is supposed to propose improvements!) Under Deming's way the boss and worker work together naturally and can even afford to like each other!

Deming's way is therefore more than just attention to quality control. It is a managerial philosophy for achieving lower cost and higher quality. And it works not only in the factory, but in hospitals, in service industries, and even in the office.

It is in seeing how a changed managerial self-image could lead to such phenomenal successes that Deming had one of those brilliant flashes of insight that few of us are privileged to have. As Newton with the apple, Einstein with relativity, Freud with the subconscious, Deming saw a new way for management.

This is the Basic Idea

If management is to be responsible for improving something as complicated as a modern assembly of machines and people (whether in the factory, the hospital, the office, or anywhere else), managers must have a way of learning (1) which parts of the problems are due to the workers and (2) which parts are due to the system. Deming understood that this can happen only if the two circumstances are fulfilled. The worker and the management can speak the same language.

The management uses the workers as essential "instruments" in understanding what is happening at the place where the work gets done.

Given the complexity of modern systems, there is no way the managers can begin to understand what is happening without the full cooperation of the workers. And even given a cooperative spirit, there is no way they can work together if they do not have a language suitable for discussing the inherent randomness in such systems.

And what is that language? It is the language of statistics. Deming, an established and esteemed statistician, understood this immediately. We all use statistics every day. It dominates the reporting of the sports announcers. We gamble. We handicap the horses. We listen to Jimmy the Greek. But for some reason or other, among "educated" people, there is a tendency to shun statistics and to avoid even the simplest taking of averages, the calculation of how much variation to expect, or when to decide that something is "unusual." Among "educated people" (for example, hosts on TV talk shows) as soon as something in elementary mathematics is introduced, one hears, "Oh, I was never very good with numbers," spoken as a badge of honor, as though the ability to do so marked one as a drudge. Among the "common folk" there may be "mathaphobia" but no one is proud of it!

Uncontrolled variations in a factory or other place of work lead to low productivity, poor quality, and increased need for capital equipment to obtain high rates of production. If the management is to control the variation, there is no escape from learning how to use statistics. Furthermore, if the cooperation of the workers is to be obtained, they, too, must learn the language of statistics.

Most American managers today tend to take the system as given and to try to get the most out of it as is. Thus they believe the problems of the factory are to be found in better understanding of morale, the work ethic, work standards, job definitions, more communications, slogans, exhortations, personnel selection, better record keeping, better union bargaining, and so on. They equate increased productivity only with increased capital spending (e.g., on automation) and

have an easy out in blaming the tax laws, interest rates, and labor rates. It never occurs to them that people do not have to work harder, just smarter. And they do not comprehend that they must provide the leadership in working smarter. "Overmanaged and Underled" is the way Don Alstadt, CEO of the Lord Corporation, describes American industry.

Of course, better communications, better equipment, better understanding of each job can contribute to efficiency. But these contributions need to be seen as part of an overall managerial framework, not isolated elements. When seen as part of an attempt to improve the system and not just attempt to get more out of the system as it is, these techniques take on a much different meaning.

In the typical corporate environment, the conventional system often works in a self-defeating way. How often is someone promoted because he or she knows how to get things done "in spite of the system"? And how often is someone passed over because he or she spent too much time developing corporate relations in a setting in which departmental infighting was the order of the day? How many managers make exorbitant demands on their workers as a way of "keeping them on their toes" rather than taking the time to discuss with them how to change the system so that the workers can do their jobs better?

If the workers and the bosses both speak the language of statistics, they will have something to discuss at their quality circle meetings. If they do not, quality circles can be an invitation to controversy and misunderstanding.

If managers adopt Deming's way, they will understand that they need the workers - not just as arms and legs to do what they are bid, but as intelligent human beings who can provide insights into how to improve the output and efficiency of the place. And we know that the improvement in management labor relations can come from such an attitude, honestly felt and experienced.

What is happening to Deming's way in America today? Dr. Deming has undertaken to teach Americans because he senses that now people are ready to listen to him. Despite his age (he is in his eighties) he has undertaken to give at least eighteen four-day seminars in 1982 plus many days of individual consultation. He will have spoken to approximately 2500 executives this year alone. Of this experience he says, "I light a number of fires. Some of them are continuing to burn."

One of the fires that has burned more brightly is in Nashua, New Hampshire where William Conway, president of the Nashua Corporation, has been implementing Deming's methods for almost two years. He credits Deming with the turnaround in his company's fortunes. With the example of the nearby Nashua Corporation and Bill Conway's help, twenty-two companies in nearby Lawrence, Massachusetts, have banded together to learn to apply Deming's methods.

Probably the biggest success of all is at the Ford Motor Company, where Don Peterson, Ford's president, has declared that "the Ford Motor Company is committed to the adoption of the methods of W. Edwards Deming." The recent contract settlement with the UAW indicates how serious Ford is. In a videotape prepared to convince Ford's employees, especially its middle management, case examples of the success of Deming's methods are given.

Similar pronouncements have been made by representatives of the Pontiac Division of General Motors.

From the experiences at Ford, Nashua Corporation, and several Japanese-managed companies in the United States, we now have substantial evidence that Deming's methods work wherever they have been seriously tried.

We may say with confidence that the poor showing of American industry in competition with the Japanese is entirely due to the management. The attitude of the government plays a role, of course, but in many cases this is also the result of management's approaches in the past. It is the culture of the managers that must change, and quickly.

There are some who say that ultimately Dr. Deming will be recognized as the Father of the Second Industrial Revolution. Be that as it may, he has this to say about future competition

"There will be no room for managers who do not know how to work with their people to produce high quality goods at low cost. High reliability cannot be secured without worker cooperation. Complex systems cannot be understood without statistics. In the competitive world of the future, companies which have not mastered these ideas will simply disappear

There will be no excuses."